

The following is a complete listing of all claims in the application, with an indication of the status of each:

Listing of claims:

1 (Currently amended). A computer-implemented auction method for holding an auction for a product comprising the steps of:

receiving bids from at least one computer or from multiple computers within a network of computers that include minimum desired volumes and maximum desired volumes and evaluation prices for said product wherein said evaluation prices are represented as a non-linear function relative to the desired volume of said product in said transaction;

generating, using computing resources, a finite set of bids that include as an element said bids that were received from said at least one computer or from multiple computers within said network of computers;

employing dynamic programming using said computing resources to generate, using said bids that were received in said receiving bids step, a subset of bids wherein a maximum gain is obtained within a range represented by a count of said product available for sale, wherein said dynamic programming includes

(i) allocating a two-dimensional array V, representing a maximum gain, to a memory area by using said dynamic programming using said computing resources;

(ii) initializing said two-dimensional array V; and

(iii) recursively solving the recursive equation for said two-dimensional array V, wherein

$$V(k, j) := \max \{ V(k+1, j), V(k, j+1), \max_{1 \leq x \leq n-k} \{ V(k+1, j+x) + e_k(x) \} \}$$

is used as the recursive equation, where V(k, j) denotes said two-dimensional array V populated with said evaluation prices; where k represents the bid number and denotes an integer equal to or greater than 1 and equal to or smaller than n; j represents the

number of the product and denotes an integer equal to or greater than 0 and equal to or smaller than s ; n denotes the number of bids; s denotes the number of products available for the transaction; e_k denotes the evaluation price when x units of products are purchased according to the bid b_k ; l_k denotes the minimum volume of the bid b_k ; and h_k denotes the maximum volume of the bid b_k ; and identifying or accepting a bid from said subset of bids, wherein a bid is selected by back tracking of said two-dimensional array V from the element on the smallest row and in the smallest column.

2-4. Canceled

5 (Currently amended). ~~The auction method according to claim 1, further comprising:~~
A computer implemented auction method for holding an auction for a product comprising the steps of:

receiving bids from at least one computer or from multiple computers within a network of computers that include minimum desired volumes and maximum desired volumes and evaluation prices for said product wherein said evaluation prices are represented as a non-linear function relative to the desired volume of said product in said transaction;

generating, using computing resources, a finite set of bids that include as an element said bids that were received from said at least one computer or from multiple computers within said network of computers;

employing dynamic programming using said computing resources to generate, using said bids that were received in said receiving bids step, a subset of bids wherein a maximum gain is obtained within a range represented by a count of said product available for sale, wherein said dynamic programming includes

(i) allocating two-dimensional arrays V , representing a maximum gain, and Q , representing a count of a product available, to a memory area by using said dynamic programming;

(ii) initializing said two-dimensional arrays V and Q ; and

(iii) recursively solving recursive equations for said two-dimensional arrays V and Q using said computing resources,
wherein

$$V(k, j) := \begin{cases} V(k+1, j) \\ V(k, j+1) \\ V(k, j+1) + e_k & \text{if } l_k \leq Q(k, j+1) < h_k \\ V(k+1, j+1) + e_k l_k \end{cases}$$

$$Q(k, j) := \begin{cases} Q(k, j+1) + 1 & \text{(if } V(k, j) = V(k, j+1) + e_k) \\ l_k & \text{(if } (k, j) = V(k+1, j+1) + e_k l_k) \\ Q(k, j+1) & \text{(if } V(k, j) = V(k, j+1)) \\ 0 & \text{(otherwise)} \end{cases}$$

is employed as said recursive equation, where V(k, j) denotes said two-dimensional array V populated with said evaluation prices; where Q(k, j) denotes said two-dimensional array Q populated with said count of said product available for sale; where k represents a bid number and denotes an integer equal to or greater than 1 and equal to or smaller than n; j represents the number of the product and denotes an integer equal to or greater than 0 and equal to or smaller than s; n denotes the number of bids; s denotes the number of products available for the transaction; e_k denotes the evaluation price when x units of products are purchased according to the bid b_k ; l_k denotes the minimum volume of the bid b_k ; and h_k denotes the maximum volume of the bid b_k , wherein a bid is selected by back tracking of said two-dimensional array V from the element on the smallest row and in the smallest column.

1 13 (Currently amended). An auction system of computing resources for holding an
2 auction for a product comprising:

3 means for receiving bids from at least one computer or from multiple
4 computers within a network of computers that include minimum desired volumes and
5 maximum desired volumes and evaluation prices for said product;

6 means for generating, using computing resources, a finite set of bids that
7 include as an element said bids that were received from said at least one computer or
8 from multiple computers within said network of computers;

9 means for employing dynamic programming using said computing resources
10 to generate, using said bids that were received from said at least one computer or from
11 multiple computers within said network of computers, a subset of bids wherein a
12 maximum gain is obtained within a range represented by a count of said product
13 available for sale, wherein said means for employing dynamic programming

14 (i) allocates a two-dimensional array V, representing a maximum gain, to a
15 memory area by using said dynamic programming using said computing resources;

16 (ii) initializes said two-dimensional array V; and

17 (iii) recursively solves the recursive equation for said two-dimensional array
18 V, wherein

19
$$V(k, j) = \max \{ V(k+1, j), V(k, j+1), \max_{1 \leq x \leq h_k} \{ V(k+1, j+x) + e_k(x) \} \}$$

20 is used as the recursive equation, where V(k, j) denotes said two-dimensional array V
21 populated with said evaluation prices; where k represents the bid number and denotes
22 an integer equal to or greater than 1 and equal to or smaller than n; j represents the
23 number of the product and denotes an integer equal to or greater than 0 and equal to
24 or smaller than s; n denotes the number of bids; s denotes the number of products
25 available for the transaction; e_k denotes the evaluation price when x units of products
26 are purchased according to the bid b_k ; l_k denotes the minimum volume of the bid b_k ;
27 and h_k denotes the maximum volume of the bid b_k ; and

means for identifying or accepting a bid from said subset of bids, wherein a bid is selected by back tracking of said two-dimensional array V from the element on the smallest row and in the smallest column.

14-16. Canceled

17 (Currently amended). ~~The auction system according to claim 13, further comprising:~~

An auction system of computing resources for holding an auction for a product comprising:

means for receiving bids from at least one computer or from multiple computers within a network of computers that include minimum desired volumes and maximum desired volumes and evaluation prices for said product;

means for generating, using computing resources, a finite set of bids that include as an element said bids that were received from said at least one computer or from multiple computers within said network of computers;

means for employing dynamic programming using said computing resources to generate, using said bids that were received from said at least one computer or from multiple computers within said network of computers, a subset of bids wherein a maximum gain is obtained within a range represented by a count of said product available for sale, wherein said means for employing dynamic programming

(i) allocates means for allocating two-dimensional arrays V, representing a maximum gain, and Q, representing a count of a product available, to a memory area by using said dynamic programming using said computer resources;

(ii) initializes means for initializing said two-dimensional arrays V and Q; and

(iii) recursively solves means for recursively solving recursive equations for said two-dimensional arrays V and Q using said computing resources,

wherein

$$V(k, j) := \begin{cases} V(k+1, j) \\ V(k, j+1) \\ V(k, j+1) + e_k & \text{if } l_k \leq Q(k, j+1) < h_k \\ V(k+1, j+1) + e_k l_k \end{cases}$$

$$Q(k, j) := \begin{cases} Q(k, j+1) + 1 & \text{(if } V(k, j) = V(k, j+1) + e_k) \\ l_k & \text{(if } (k, j) = V(k+1, j+1) + e_k l_k) \\ Q(k, j+1) & \text{(if } V(k, j) = V(k, j+1)) \\ 0 & \text{(otherwise)} \end{cases}$$

24 is employed as said recursive equation, where $V(k, j)$ denotes said two-dimensional
 25 array V populated with said evaluation prices; where $Q(k, j)$ denotes said two-
 26 dimensional array Q populated with said count of said product available for sale;
 27 where k represents a bid number and denotes an integer equal to or greater than 1 and
 28 equal to or smaller than n ; j represents the number of the product and denotes an
 29 integer equal to or greater than 0 and equal to or smaller than s ; n denotes the number
 30 of bids; s denotes the number of products available for the transaction; e_k denotes the
 31 evaluation price when x units of products are purchased according to the bid b_k ; l_k
 32 denotes the minimum volume of the bid b_k ; and h_k denotes the maximum volume of
 33 the bid b_k , wherein a bid is selected by back tracking of said two-dimensional array V
 34 from the element on the smallest row and in the smallest column.

35 18-24. Canceled

1 25 (Currently amended). A computer-readable storage medium on which a program
2 for holding an auction for a product is stored, said program enabling computing
3 resources to perform:

4 a process for receiving bids from at least one computer or from multiple
5 computers within a network of computers that include minimum desired volumes and
6 maximum desired volumes and evaluation prices for said product wherein said
7 evaluation prices for said product are represented as a non-linear function relative to
8 the desired volume of said product;

9 a process for generating, using computing resources, a finite set of bids that
10 include as an element said bids that were received from said at least one computer or
11 from multiple computers within said network of computers;

12 a process for employing dynamic programming using said computing
13 resources to generate, using said bid set that were received while using said process
14 for receiving bids, a subset of bids wherein a maximum gain is obtained within a
15 range represented by a count of said product available for sale, wherein said dynamic
16 programming includes

17 (i) allocating a two-dimensional array V, representing a maximum gain, to a
18 memory area by using said dynamic programming using said computing resources;

19 (ii) initializing said two-dimensional array V; and

20 (iii) recursively solving the recursive equation for said two-dimensional array
21 V, wherein

22
$$V(k, j) := \max \{ V(k+1, j), V(k, j+1), \max_{1 \leq x \leq h_k} \{ V(k+1, j+x) + e_k(x) \} \}$$

23 is used as the recursive equation, where V(k, j) denotes said two-dimensional array V
24 populated with said evaluation prices; where k represents the bid number and denotes
25 an integer equal to or greater than 1 and equal to or smaller than n; j represents the
26 number of the product and denotes an integer equal to or greater than 0 and equal to

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27 or smaller than s ; n denotes the number of bids; s denotes the number of products
28 available for the transaction; e_k denotes the evaluation price when x units of products
29 are purchased according to the bid b_k ; l_k denotes the minimum volume of the bid b_k ;
30 and h_k denotes the maximum volume of the bid b_k ; and
31 a process for identifying or accepting a bid from said subset of bids, wherein a
32 bid is selected by back tracking of said two-dimensional array V from the element on
33 the smallest row and in the smallest column.

1 26-27. Canceled